Table 5.1: Comparison of soil volumes, open space, and underground space needed for open grown tree vs. tree in suspended pavement, rock based structural soil, sand based structural soil, and soil boxes.

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| **Technique** | **Soil volume provided per cubic foot rooting zone (not including pavement profile where applicable)** | **Open space needed to grow a 30’ diameter canopy tree assuming 34” soil depth\*** | **Total volume recommended per 30’ diameter canopy tree\*** | **Surface Area of Soil Volume Needed Assuming 34” deep\*\* soil per 30’ diameter canopy tree\*** | **Structural Capacity (Traffic load supported)** |
| Open tree pit (no pavement or foot traffic above rooting space) | 1 c.f. | 500 s.f. | 1413 c.f. | 500 s.f. | Not even foot traffic should be allowed on open tree pits |
| Structural cells | 0.92 c.f. | 5’ x 5’ | 1536 c.f. | 543 s.f. | Can support vehicle loading  up to AASHTO H-20 rating of 32,000 lbs. per axle (U.S. Federal Highway Bridge Standard). This rating refers to the ability of a roadway to safely accommodate  3-4 axle vehicles, such as a large semi-truck and trailer (Deeproot website) |
| Rock based structural Soils | 0.2 c.f | 5’ x 5’ | 7065 c.f. | 2493.5 s.f. | Can be used under pedestrian mall paving, sidewalks, parking lots, and low-use access roads |
| Sand based structural soils | 1 c.f. | 5’ x 5’ | 1413 c.f. | 500 s.f. | No standard test data available; Amsterdam sand settled 19 mm in 3 years compared to the surrounding pavement (Couenberg 1993), which is generally not acceptable in the U.S. |
| Soil boxes | 1 c.f. | Not large enough to grow 30’diameter tree | Not large enough to grow 30’diameter tree | Not large enough to grow 30’diameter tree |  |

\*Based on 2 c.f. of soil volume per 1 c.f. of canopy area (see Task 4 for supporting research), assumes Silva Cells are used for structural cells, assumes 92% void space in Silva Cells; assumes CU Structural Soil is used for rock based structural soil; assumes soil component of rock based structural soil is 20%.

\*\* 34 inches is the depth of 2 stacks of Silva Cells and was selected to obtain equal depths among all treatments.